PTO/SB/21 (04-07)
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Total Number of Pages in This Submission

Application Number	09/608,743
Filing Date	June 30, 2000
First Named Inventor	Jerrell P. Hein
Art Unit	2615
Examiner Name	Briney III, Walter F.
Attorney Docket Number	75622.P0018

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
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- ☐ Certified Copy of Priority Document(s)
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  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
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- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
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Remarks

The appeal communication is a supplemental Appeal Brief submitted in response to the Notification of Non-Compliant Brief mailed October 22, 2007.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Davis & Associates		
Signature	William D. Davis		
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Date	November 23, 2007	Reg. No.	38,428

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75622.P0018 Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:

Jerrell P. Hein

Application No: 09/608,743

Filed: June 30, 2000

For: SUBSCRIBER LINE INTERFACE CIRCUITRY WITH COMMON BASE AUDIO ISOLATION STAGE

Examiner: Briney III, Walter F.

Art Unit: 2615

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Supplemental Appeal Brief Under 37 C.F.R. § 41.37

This supplemental appeal brief is submitted in response to a Notification of Non-Compliant Appeal Brief dated October 22, 2007 which set a 30 day time period for response expiring November 22, 2007. Given that November 22, 2007 is a federal holiday, appellant submits this supplemental appeal brief is timely filed if deposited on or before November 23, 2007 as indicated by the above certificate of mailing.

The Notification suggested that a status of all claims was lacking and that there was not an indication of claims on appeal. Appellant submits that this Brief addresses these issues.

Appellant respectfully requests consideration of this Appeal by the Board of Patent Appeals and Interferences for allowance of the above-referenced application.

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I. REAL PARTY IN INTEREST

The above-identified application for patent is assigned to Silicon Laboratories, Inc., the real party in interest. Silicon Laboratories, Inc. is a Delaware corporation having a principal place of business at 400 W. Cesar Chavez, Austin, Texas 78701.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any other related appeals or interferences that may directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

III. STATUS OF THE CLAIMS

Claims 1, 3, 5-7, 9, 10, 12-16, and 18-20 are pending.

Claims 2, 4, 8, 11, 17 are canceled.

Claims 1, 3, 5-7, 9, 10, 12, 15, 16, and 18 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,274,702 of Rosch, et al. ("Rosch") in view of U.S. Patent No. 4,151,482 of Robe ("Robe").

Claims 1, 5, 9, and 15 were rejected as being unpatentable over Rosch in view of U.S. Patent No. 4,284,958 of Pryor, et al. ("Pryor").

Claims 13, 14, 19, and 20 are objected to.

Appellant notes that although claims 13, 14, 19, and 20 are objected to, they will automatically become allowable if claims 9 and 15 are found allowable.

Appellant is appealing the rejection of rejected claims 1, 3, 5-7, 9, 10, 12, 15, 16, and 18. The claims and claim status are set forth in the Claims Appendix.

IV. STATUS OF AMENDMENTS

The Claims Appendix of this Appeal Brief reflects the claims and amendment status. No amendments have been submitted since the Final Office Action dated September 20, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A. Overview

A subscriber line connects subscriber equipment such as a telephone to a central office. A subscriber line interface circuit (SLIC 110) provides the interface between the subscriber line and a digital switching network such as the public switched telephone network. The SLIC is responsible for controlling the subscriber loop/line (132) DC feed as well as communicating voiceband signals from the network to the subscriber equipment (130) and from the subscriber equipment to the network. In the present case, the SLIC utilizes control currents (I1-I4) provided to common base transistors (Q1-Q4) to control the large signal DC feed. The voiceband signals are superimposed as currents (530) upon the control currents. This permits the elimination of a pair of coupling capacitors and allows the SLIC better control over synthesizing the impedance. (Specification, p. 1, lines 7-18; p. 6, lines 1-15; p. 2, lines 3-14; p. 13, line 1 – p. 14, line 12; Figs. 1, 2, 4, 5A)

B. Summary of Claim 1

Claim 1 includes receiving an outgoing (i.e., downstream) audio signal. The signal is coupled to a subscriber line (580/590) through a plurality of transistors (Q1-Q4) coupled in a common base configuration. Linefeed driver control signals (I1-I4) for controlling battery feed to the subscriber line and the audio signal are received as currents on the same signal lines. (Specification, p. 13, line 8-p. 14, line 12; Fig. 5A)

C. Summary of Claim 5

Claim 5 is directed to receiving linefeed driver control signals (I1-I4) and outgoing (i.e., downstream) audio signals (530) as currents on the same plurality of signal lines. The outgoing audio signals (530) are provided to a subscriber line (580/590) through a common base isolation stage (Q1-Q4). (Specification, p. 13, line 8-p. 14, line 12; Fig. 5A)

D. Summary of Claim 9

Claim 9 is directed to a subscriber line interface circuit apparatus. A first circuit (540) for coupling a received outgoing audio signal (530) to a subscriber line (580/590) couples the received outgoing audio signal (530) to the subscriber line through a common base isolation stage (Q1-Q4). The first circuit controls battery feed to the subscriber line in accordance with received linefeed driver control signals (I1-I4). The linefeed driver control signals and the outgoing audio signal are received as currents on the same signal lines. (Specification, p. 13, line 8 – p. 14, line 17; Fig. 5A)

E. Summary of Claim 15

Claim 15 is directed to a method for controlling a subscriber line interface circuit DC feed. A signal processor (210) provides an outgoing audio signal. A linefeed driver (220, 410) is coupled to receive the outgoing audio signal and at least one linefeed driver control signal as currents on the same signal line (212). The linefeed driver (540) couples the received outgoing audio signal (530) to a subscriber line (580/590) through a common base isolation stage (Q1-Q4). The linefeed driver provides battery feed to the subscriber line in accordance with the linefeed driver control signal (I1-I4). (Specification, p. 13, line 8 – p. 14, line 17; Figs. 2, 4, 5A)

VI. GROUNDS OF REJECTION TO BE REVIEWED UPON APPEAL

The rejection of claims 1, 3, 5-7, 9, 10, 12, 15, 16, and 18 under 35 U.S.C. § 103 over various combinations of Rosch, Robe, and Pryor.

VII. ARGUMENT

A. Rejection of claims 1, 5, 9, 15 and 18 under 35 U.S.C. § 103

1. Statement of Law

In order to sustain a rejection under 35 U.S.C. § 103, three criteria must be met:

> *First*, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *Second*, there must be a reasonable expectation of success. *Finally*, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure

(*In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991)(*emphasis added*)

Appellant respectfully submits that the Examiner has not established a *prima facie* case of obviousness under 35 U.S.C. § 103.

2. ***References when combined do not teach all claim limitations***

a. **References do not teach or suggest coupling a received audio signal to a subscriber line through a plurality of transistors coupled in a common base configuration, wherein the audio signal and the linefeed driver control signals are received as currents on the same signal lines**

The Examiner made the statement "As shown in the proceeding [sic] section entitled Response to Arguments, classifying an amplifier as a voltage amplifier is merely a mathematical convenience, but in reality, all amplifiers produce output currents in operation."

The Examiner appears to be arguing that certain claim limitations may simply be ignored for purposes of assessing patentability. Appellant traverses the Examiner's statement in part.

There is a notable functional difference in current amplifiers and voltage amplifiers. An ideal voltage amplifier will provide voltage amplification independent of the load, whereas the relationship between the output current and the input voltage will be based upon the load and the amplification factor. An ideal current amplifier will provide current amplification independent of the load, whereas the output relationship between the output voltage and the input current will be based upon both the load and the amplification factor. This is no mere mathematical "convenience" particularly when the SLIC is expected to function properly in environments where the load is unknown or varying. For

example, the subscriber lines are of varying lengths and customer premises may have multiple extensions such that more than one is on-hook or off-hook at the same time. Thus appellant submits that the Examiner is not free to simply ignore claim limitations based upon an alleged mathematical convenience.

None of the references, alone or combined, teaches or suggests *i) coupling the audio signal to the subscriber line through a plurality of transistors coupled in a common base configuration,* and *ii)* receiving linefeed driver control signals for controlling battery feed to the subscriber line, *wherein the audio signal and the linefeed driver control signals are received as currents on the same signal lines.*

Rosch was cited for disclosing a telephone line interface circuit that receives an outgoing audio signal from the central office on a receive line which is coupled to the subscriber line through amplifier circuits. Rosch includes a disclosure of a subscriber line interface circuit having a sense network (Rosch, Fig. 2) and a line drive circuit (Rosch, Fig. 3). The line drive circuit is coupled to the tip and ring wires of the telephone line via the sensing network. The sensing network senses the tip and ring lines to determine the subscriber line differential current (ID), loop current (IL), common mode voltage (VCM), and common mode current (ICM). A digital control circuit within the linefeed driver monitors the sensed IL, ICM, and VCM and adapts the line interface circuitry. (Rosch, col. 11, lines 7-16).

Rosch's amplifiers are clearly unity gain voltage amplifiers. The linefeed "control" and the audio signal are received as *voltages* that are applied to *voltage* amplifiers. Rosch does not teach or suggest the use of common base transistor amplifier stages for 132, 134. Moreover, since Rosch teaches unity or greater gain for 132, 134 (Rosch, col. 10, lines 30-38), applicant submits that Rosch *teaches away* from the use of common base transistor amplifier stages since such configurations provide less than unity gain.

Pryor and Robe include disclosures of a common base amplifier stage, however, such circuitry is integral to overall *voltage* amplifier circuitry. (Robe, col. 2, lines 29-55; Figs. 1-4)(Pryor, col. 1, lines 13-28)

None of the cited references, alone or combined, teaches receiving either the linefeed driver control signals or the audio signal as *currents*.

Thus none of the references, alone or combined, teaches or suggests *i) coupling the audio signal to the subscriber line through a plurality of transistors coupled in a common base configuration,* and *ii)* receiving linefeed driver control signals for controlling battery feed to the subscriber line, *wherein the audio signal and the linefeed driver control signals are received as currents on the same signal lines.*

In contrast, amended claim 1 includes the language:

> 1. A method comprising the steps of:
> a) receiving an outgoing audio signal; and
> b) *coupling the audio signal to a subscriber line through a plurality of transistors coupled in a common base configuration;* and
> c) *receiving linefeed driver control signals for controlling battery feed to the subscriber line, wherein the audio signal and the linefeed driver control signals are received as currents on the same signal lines.*

(Claim 1, as amended)(*emphasis added*)

Similar arguments may be made with respect to amended claims 5, 9, and 15 which include the language:

> 5. A method comprising the steps of:
> a) *receiving linefeed driver control signals and outgoing audio signals as currents on a same plurality of signal lines;* and
> b) *providing the outgoing audio signals to a subscriber line through a common base isolation stage.*

(Claim 5)(*emphasis added*)

> 9. A subscriber line interface circuit apparatus, comprising:
> a first circuit for coupling a received outgoing audio signal to a subscriber line, *wherein the first circuit couples the received outgoing audio signal to the subscriber line through a common base isolation stage, wherein the first circuit controls battery feed to the subscriber line in accordance with received linefeed driver control signals, wherein the linefeed driver control signals and the outgoing audio signal are received as currents on the same signal lines.*

(Claim 9)(*emphasis added*)

15. A subscriber line interface circuit apparatus, comprising:
a signal processor providing an outgoing audio signal; and
a linefeed driver coupled to receive the outgoing audio signal and at least one linefeed driver control signal as currents on the same signal line, wherein the linefeed driver couples the received outgoing audio signal to a subscriber line through a common base isolation stage, wherein the linefeed driver provides battery feed to the subscriber line in accordance with the linefeed driver control signal.

(Claim 15)(*emphasis added*)

Thus appellant submits the cited references alone or combined do not teach or suggest all claim limitations of claims 1, 5, 9, and 15.

3. No suggestion to combine references

The Examiner appears to be arguing that Rosch should be modified in view of Robe or Pryor in an effort to achieve appellants claimed subject matter.

Although the Examiner has proposed that it is obvious to couple transistors in the common base configuration and therefore one would have been motivated to modify Rosch in view of Robe, appellant disagrees (see 02/09/2006 Office Action , p. 3)

Rosch teaches the use of voltage amplifiers, accordingly the control signals are voltage-based rather than current based. The Examiner has suggested that Robe's folded cascode amplifiers could be substituted for Rosch's elements 132, 134 however no such simple substitution is possible. Robe clearly requires additional biasing voltages, additional voltage divider loads for feedback, and still does not disclose the common base stage alleged by the Examiner.

Appellant respectfully submits that Q3 and Q4 do not form a "common base stage" as the Examiner has claimed (02/09/2006 Office Action, p. 3-4). A "common base" configuration is so-named because the signal source and the load share the base of the transistor as a common connection point from an AC analysis viewpoint (i.e., DC voltages ignored). As noted by Robe, Q3 is functioning as an emitter follower, not a common base stage. (Robe, col. 3, lines 22-28). Thus the Examiner's representations are contrary to the express teachings of Robe.

With respect to Pryor, appellant respectfully submits that there is nothing in particular that would suggest one skilled in the art to use this circuit for either of 132 or 134. Even if one did, the combination fails to illustrate receiving the linefeed control signals and audio signals as currents as claimed. Pryor discloses voltage amplifiers which would be substituted for the voltage amplifier of Rosch which still fails to address appellant's claim language.

B. Claims 1, 5, 9, and 15 patentable under 35 U.S.C § 103

In view of the arguments presented above, appellant respectfully submits claims 1, 5, 9, and 15 are patentable under 35 U.S.C. § 103.

C. Claims 3, 6-7, 10, 12-14, 16, and 18-20 are patentable by dependency

Based on the arguments presented above, appellant submits that claims 1, 5, 9, and 15 are patentable under 35 U.S.C. § 103 in view of the cited references. Given that claim 3 depends from claim 1; claims 6-7 depend from claim 5; claims 10 and 12-14 depend from claim 9; and claims 16 and 18-20 depend from claim 15; appellant submits claims 3, 6-7, 10, 12-14, 16, and 18-20 are likewise patentable under 35 U.S.C. § 103 in view of the cited references.

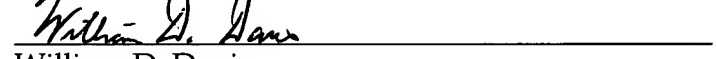
VIII. CONCLUSION

Appellant respectfully submits that the stated rejections cannot be maintained in view of the arguments set forth above. Appellant respectfully requests that the Board of Patent Appeals and Interferences direct allowance of the pending claims 1, 3, 5-7, 9, 10, 12-16, and 18-20.

If there are any issues that can be resolved by telephone conference, the undersigned representative of the appellant may be contacted at **(512) 858-9910.**

Respectfully submitted,

November 23, 2007
Date



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CLAIMS APPENDIX

1. (PREVIOUSLY PRESENTED) A method comprising the steps of:

a) receiving an outgoing audio signal; and

b) coupling the audio signal to a subscriber line through a plurality of transistors coupled in a common base configuration; and

c) receiving linefeed driver control signals for controlling battery feed to the subscriber line, wherein the audio signal and the linefeed driver control signals are received as currents on the same signal lines.

2. (CANCELED)

3. (ORIGINAL) The method of claim 1 wherein the plurality of transistors comprises bipolar junction transistors.

4. (CANCELED)

5. (PREVIOUSLY PRESENTED) A method comprising the steps of:

a) receiving linefeed driver control signals and outgoing audio signals as currents on a same plurality of signal lines; and

b) providing the outgoing audio signals to a subscriber line through a common base isolation stage.

6. (PREVIOUSLY PRESENTED) The method of claim 5 further comprising the step of:

c) controlling a battery feed to a tip node and a ring node of the subscriber line in accordance with the linefeed driver control signals.

7. (ORIGINAL) The method of claim 5 wherein the common base isolation stage comprises a plurality of bipolar junction transistors coupled in a common base configuration.

8. (CANCELED)

9. (PREVIOUSLY PRESENTED) A subscriber line interface circuit apparatus, comprising:

a first circuit for coupling a received outgoing audio signal to a subscriber line, wherein the first circuit couples the received outgoing audio signal to the subscriber line through a common base isolation stage, wherein the first circuit controls battery feed to the subscriber line in accordance with received linefeed driver control signals, wherein the linefeed driver control signals and the outgoing audio signal are received as currents on the same signal lines.

10. (ORIGINAL) The apparatus of claim 9 wherein the first circuit comprises a plurality of bipolar junction transistors coupled in a common base configuration.

11. (CANCELED)

12. (ORIGINAL) The apparatus of claim 9 wherein the first circuit comprises:

a tip control circuit, wherein the tip control circuit increases a tip node voltage in response to a first tip control signal, wherein the tip control circuit decreases a tip node voltage in response to a second tip control signal; and

a ring control circuit wherein the ring control circuit increases a ring node voltage in response to a first ring control signal, wherein the ring control circuit decreases a ring node voltage in response to a second ring control signal.

13. (ORIGINAL) The linefeed driver of claim 12 wherein the tip control circuit comprises:

a first transistor of a first type having an emitter coupled to receive the first tip control signal;

a second transistor of the first type having an emitter coupled to receive the second tip control signal, wherein a base of each of the first and second transistors is coupled to a first node as a signal ground;

a third transistor of a second type having a collector coupled to a collector of the first transistor and an emitter coupled to a second node;

a resistor having a first end coupled to the second node, a second end of the resistor coupled to a base of the third transistor and a collector of the second transistor.

14. (ORIGINAL) The subscriber line linefeed driver of claim 13 wherein the first type is a PNP bipolar junction transistor, wherein the second type is an NPN bipolar junction transistor.

15. (PREVIOUSLY PRESENTED) A subscriber line interface circuit apparatus, comprising:

a signal processor providing an outgoing audio signal; and

a linefeed driver coupled to receive the outgoing audio signal and at least one linefeed driver control signal as currents on the same signal line, wherein the linefeed driver couples the received outgoing audio signal to a subscriber line through a common base isolation stage, wherein the linefeed driver provides battery feed to the subscriber line in accordance with the linefeed driver control signal.

16. (ORIGINAL) The apparatus of claim 15 wherein the common base isolation stage comprises a plurality of bipolar junction transistors coupled in a common base configuration.

17. (CANCELED)

18. (ORIGINAL) The linefeed driver of claim 15 wherein the linefeed driver comprises:

a tip control circuit, wherein the tip control circuit increases a tip node voltage in response to a first tip control signal, wherein the tip control circuit decreases a tip node voltage in response to a second tip control signal; and

a ring control circuit wherein the ring control circuit increases a ring node voltage in response to a first ring control signal, wherein the ring control circuit decreases a ring node voltage in response to a second ring control signal, wherein the signal processor provides the first and second tip control signals and the first and second ring control signals.

19. (ORIGINAL) The linefeed driver of claim 18 wherein the tip control circuit comprises:

a first transistor of a first type having an emitter coupled to receive the first tip control signal;

a second transistor of the first type having an emitter coupled to receive the second tip control signal, wherein a base of each of the first and second transistors is coupled to a first node as a signal ground;

a third transistor of a second type having a collector coupled to a collector of the first transistor and an emitter coupled to a second node; and

a resistor having a first end coupled to the second node, a second end of the resistor coupled to a base of the third transistor and a collector of the second transistor.

20. (ORIGINAL) The linefeed driver of claim 19 wherein the first type is a PNP bipolar junction transistor, wherein the second type is an NPN bipolar junction transistor.

EVIDENCE APPENDIX

This Section Not Applicable

RELATED PROCEEDINGS APPENDIX

This Section Not Applicable